

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of: GALLIGAN et al.	:
	:
Application No.: 10/612,658	: Group Art Unit: 1793
	:
Filed: July 2, 2003	: Examiner: Nguyen, Ngoc Yen M.
	:
For: PLIABLE METAL CATALYST	: Confirmation No.: 5534
CARRIERS, COMFORMABLE	:
CATALYST MEMBERS MADE	:
THEREFROM AND METHODS OF	:
INSTALLING THE SAME	:
	:

Commissioner for Patents
P.O. Box 1450
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REPLY BRIEF

Sir:

This paper is submitted in response to the Examiner's Answer mailed on April 2, 2009, in the above-identified application. Submission of a reply brief in this case is due by June 2, 2009. Accordingly, this paper is being timely filed. Appellants respectfully request that the following remarks be considered.

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1. Status of the Claims

Claims 1-3, 5, 6, 30-35 and 37-43 were finally rejected in an Office Action mailed on July 14, 2008 ("the Final Office Action"), and are the subject of this appeal. Claims 4, 7-29 and 36 were previously cancelled without prejudice or disclaimer.

2. Related Appeals and Interferences

As indicated in the Examiner's Answer, related appeals to the Board of Patent Appeals & Interferences which may affect or have a bearing on this appeal include the appeal in related U.S. Patent Application No. 10/376,836, decided on May 21, 2007 (Appeal No. 2007-1178; appended hereto as **Exh. 1**). Other related appeals which may affect or have a bearing on this appeal include the appeal in related U.S. Patent Application No. 10/376,782, also decided on May 21, 2007 (Appeal No. 2007-1018; appended hereto as **Exh. 2**), and the pending appeal in related U.S. Patent Application No. 10/810,195, the notice of which was filed on March 26, 2009.

3. Grounds of Rejection to be Reviewed on Appeal

I. Whether 1-3, 5, 6 and 31-34, 37, 38 and 40-43 are unpatentable under 35 U.S.C. § 103(a) over Ishida (US 4,455,281; "Ishida") in view of Uchida et al. (EP 0831211; "Uchida").

II. Whether claims 30, 35 and 39 are unpatentable under 35 U.S.C. § 103(a) over Ishida in view of Uchida, and further in view of Donomoto et al. (US 4,798,770; "Donomoto") or Draghi et al. (US 6,042,879; "Draghi").

III. Whether claims 1-3, 5, 6, 30-35 and 37-43 are unpatentable under 35 U.S.C. § 103(a) over Gorynin et al. (US 5,204,302; "Gorynin") in view of Uchida, optionally further in view of Rondeau (US 4,027,367; "Rondeau") and Ishida.

4. Argument

Appellants respectfully set forth this Reply Brief on the ground that, like the Final Office Action, the Examiner's Answer fails to establish a *prima facie* case of obviousness.

Claims 1 and 34

In the Examiner's Answer, the main focus of the rejection of claims 1 and 34 continues to be that the recitations in claim 1 – “an intermetallic anchor layer having a catalytic coating applied thereto which remains intact on the carrier when the conformable catalyst member is bent along its length and mounted within a bent or curved portion of an exhaust pipe” – and claim 34 – “the catalyst member being conformable along its length such that when placed in a bent or curved configuration to provide intimate contact of the exhaust gas with the catalytic coating of conformable catalyst member to promote reactions to convert noxious components of the exhaust gas, the catalytic coating remains intact on the carrier” – are not positive limitations but rather statements of intended use.

According to the Examiner, the claims only require that the catalyst member be conformable (i.e., bendable) and mountable in a curve (but not necessarily mounted). The Examiner states that there is no evidence to show that if a catalyst member was formed by bending a carrier into the shape of a corrugated tube before depositing an anchor layer and a catalytic layer, it would not be "conformable" as compared to a catalyst member was formed by bending a carrier into the shape of a corrugated tube after depositing an anchor layer and a catalytic layer. However, even if the catalyst member was required to be placed in a bent or curved portion of an exhaust pipe, the Examiner

asserts that the catalyst member would not be required to be bent because even a straight catalyst member can be placed in a curve if the radius of the curvature is large. Furthermore, even if required to be bent to fit into a curved or bent portion of an exhaust pipe, any resulting configuration resulting from bending is a product-by-process limitation, and that whether the catalyst member is bent before or after the deposition step, the final catalyst member still has the same bent shape, the same coatings, and can still fit or be mounted either a bent or curved portion of an exhaust pipe. In either case, according to the Examiner, the coating in Ishida would inherently remain intact because of the anchor layer.

Appellants maintain that the bending of the conformable catalyst member and its placement within a bent or curved portion of an exhaust pipe (claim 1) or in a bent or curved configuration (claim 34) are positive limitations of the claims, not simply statements of intended use, and it is error for the Examiner to disregard this feature of the claims. Appellants maintain that *In re Watanabe* is controlling in this case. As noted in the Appellants' Appeal Brief, the court found that the clause "which will produce an electromotive force when inserted into a solution of a salt" was not merely a statement of intended use, but rather defined a particular type of electrode which had significant advantages over any electrode of the prior art when used for the particular purpose for which it is intended. *See* 315 F.2d at 928.

Like the clause at issue in *Watanabe*, claims 1 and 34 properly define a particular type of catalyst member (i.e., conformable) having advantages when used for its intended purpose (i.e., placement in a bent or curved portion of an exhaust pipe). Those advantages are realized only when the catalyst is bent or conformed along its length.

Thus, the proper framework for assessing patentability in this case is not all catalyst members, but only those catalyst members which can be bent or conformed along its length, yet retain catalytic coatings even following placement in a bent or curved portion of an exhaust pipe. As explained in Appellants' Appeal Brief, none of the art of record teaches or suggests a catalyst member with these features. See *In re Stencel*, 828 F.2d 751, 752-54 (Fed. Cir. 1987) ("As a matter of claim draftsmanship, appellant is not barred from describing the driver in terms of the structure imposed upon it by the collar having plastically deformable lobes [:'A driver for setting a joint of a threaded collar . . . having plastically deformable lobes . . . , the driver comprising . . .']. The framework – the teachings of the prior art – against which patentability is measured is not all drivers broadly, but drivers suitable for use in combination with this collar, for the claims themselves are so limited.").

The Examiner attempts to distinguish *Watanabe* by stating that it appears that the electrode would not inherently produce an electromotive force when inserted into a salt solution, whereas the "remains intact" property recited in claims 1 and 34 is inherently achieved in *Ishida* because of the anchor layer. However, the inherency of the "remains intact" property is beside the point. The Examiner may be correct that the prior art electrode in *Watanabe* would not produce an electromotive force when inserted into a salt solution, but this was relevant because the prior art electrode was intended to be placed into a salt solution, as this was its normal environment. In contrast, as shown in the art of record, a bent or curved portion of an exhaust pipe was not the normal placement of a catalyst member. For example, as explained in Appellants' Appeal Brief, although Figures 16A and B of *Uchida* show exhaust purifying apparatuses containing curved

portions, none of the exhaust purifiers are positioned in the curved portions. Rather, they are all placed in the linear regions of the apparatuses due to the fact that they are not conformable or bendable. Purifier 50 in Figure 16A, which the Examiner asserts is bent to conform to a bend in the exhaust pipe, is the same as the purifier shown in Figure 12 of Uchida (*see* col. 13, lines 12-19), which is shown as a straight unit containing a straight plate.

As such, whether the catalytic coating would inherently remain intact if placed with the bent or curved portion of an exhaust pipe does not address the issue of whether the cited references would have suggesting bending or conforming a catalyst member along its length and placing it in a bent or curved portion of the tail pipe. As explained Appellants' Appeal Brief, and notwithstanding the Examiner's assertion that metal plates naturally have some flex, there is no teaching or suggestion in the art of record that the disclosed catalyst members are bendable along their length (as opposed to being rolled into a tube), or that they can or should be placed in a bent or curved portion of an exhaust pipe.

Claims 37-43

The Examiner acknowledges in the Examiner's Answer that claims 37-43 positively recite that the catalyst member is disposed with a bent or curved portion of an exhaust pipe, but maintains that the circular cross section of an exhaust pipe can be considered as the claimed "curved portion." Thus, when a catalyst member has a tube shape, the circular cross section of the tube is considered as being placed into the curved portion of the exhaust pipe (similar to concentric pipes). However, the Examiner ignores the fact that claim 1, from which claims 37-42 ultimately depends, requires that the

catalyst member be "bent along its length," which is distinct from rolling into a tube. Since the catalyst member is bent longitudinally, not merely rolled, it logically follows that the "bent or curved portion of the exhaust pipe" recited in claims 37-43 must also refer longitudinal deformation. This is consistent with the specification, which states, e.g., that "upon bending or flexing of conformable catalyst member 126 to insert it within curved or bent passageways, catalytic coating 48 does not separate from conformable catalyst member 126. Typical curved or bent passageways are illustrated by exhaust pipes 20 and 42 of Figures 1A and 2A, respectively." *See* page 9, lines 24-28. A review of Figure 1A and 2A show that the portions of the exhaust pipes into which the catalyst members 26 and 126 are placed do indeed contain longitudinal bends. As such, the Examiner's assertion that the circular cross section of the exhaust pipe can be considered as the claimed "curved portion" does not withstand scrutiny.

Galligan Declaration

The Examiner states that the results described in the Declaration Under 37 C.F.R. § 1.132 of Michael P. Galligan submitted on October 30, 2007 ("the Galligan Declaration") were not found persuasive because the claimed invention was not compared to the closest prior art, namely the catalyst in Gorynin or Ishida. The Examiner also states that there is no evidence to show that the Flextube has the same "corrugated" or "perforated plate member" configuration as recited in claims 1 and 34, respectively, or that there is an intermediate anchor layer on the Flextube. Finally, the Examiner states that the allegedly unexpected results are not commensurate in scope with the claims because the claims are drawn to a catalyst product, which can be used in various applications other than treatment of motorcycle exhaust.

Appellants maintain that any evidence of obviousness has been successfully rebutted by the data submitted in paragraphs 5-10 and Exhibit A of the Galligan Declaration. Regarding the Examiner's first point, Appellants note that there is no requirement that the claimed invention be compared to the prior art identified by the Examiner as "closest." Appellants are permitted, and actually required, to compare the claimed invention to art that is closer than what the Examiner identifies. *See In re Holladay*, 584 F.2d 384, 386-87 (CCPA 1978). Here, as discussed above, the claims positively require bending of the conformable catalyst member and placing it within a bent or curved portion of an exhaust pipe (claim 1) or in a bent or curved configuration (claim 34). Since neither Gorynin nor Ishida discloses a catalyst member placed within a bend or curve within an exhaust manifold or exhaust flow pipe, Appellants maintain that placement of the rigid catalyst tube in a linear portion of the exhaust pipe was an appropriate comparison for the testing described in the Galligan Declaration. Notwithstanding the ability of Gorynin's catalyst to be corrugated and rolled into a tube, the placement of the comparative catalyst member in the linear portion of the exhaust pipe is consistent with its inability to be conformed to fit within the curved portions of the pipe. Forcing Appellants to somehow convert the rolled catalyst of Gorynin into a flexible tube capable of being placed in the bent portion of the exhaust pipe for the purposes of comparative testing would lead to the absurd result of "requiring comparison of the results of the invention with the results of the invention." *See In re Chapman*, 357 F.2d 418, 422 (CCPA 1966).

Regarding the Examiner's second point, Figures 1 and 10 Exhibit A of the first Galligan Declaration clearly show that the comparative rigid tube is corrugated and

rolled, just as the catalyst is Gorynin is alleged to be by the Examiner. In addition, paragraph 6 of the Galligan Declaration states that "conformable catalyst members as described and claimed in the patent application referenced above were tested and compared to rigid heat tubes for catalytic activity when inserted in the exhaust pipe of a 4-stroke motorcycle engine," and paragraph 10 states that "the Flextube is similar in configuration to the tubular member recited in claim 1," clearly indicating that the Flextube contained an intermediate anchor layer. This is consistent with the ability of the Flextube to efficiently function in the close-coupled position in the motorcycle exhaust pipe (i.e., retention of catalytic material following bending). Although, as the Examiner notes, paragraph 10 of the Galligan Declaration goes on to state that "I *expect* that a catalyst member having the configuration as recited in claims 34 and 35 *would* produce similar results" (Examiner's emphasis), Appellants submit that such a reasonable inference is entitled to consideration, particular since the underlying facts on which it is based (i.e., they are bendable and able to be placed within a bent or curved portion of an exhaust pipe) are not in dispute. *See* MPEP § 716.01(c) ("Although factual evidence is preferable to opinion testimony, such testimony is entitled to consideration and some weight so long as the opinion is not on the ultimate legal conclusion at issue.").

Regarding the Examiner's final point, Appellants respectfully disagree with the Examiner's conclusion that the unexpected results are not commensurate in scope with the claims. Contrary to the Examiner's implication, this is not a case where applicant has failed to show unexpected results over a broad claimed range by providing results over only a narrow range. Rather, Appellants have provided test data using the claimed catalyst member under conditions most suitable for showing unexpected results (i.e.,

close-coupled position adjacent to a 4-stroke engine). *See* Galligan Decl., Exh. A, at 10. Appellants submit that unexpected results need not be shown for all other possible uses of the claimed subject matter.

As such, Appellants maintain that the results described in the first Galligan Declaration are unexpected and commensurate in scope with the claimed invention and must be considered when assessing patentability. *See In re Soni*, 54 F.3d 746, 750 (Fed Cir 1995) ("Consistent with the rule that all evidence of nonobviousness must be considered when assessing patentability, the PTO must consider comparative data in the specification in determining whether the claimed invention provides unexpected results."). Such results clearly demonstrate that the claimed catalyst member would not have been obvious over the art of record.

CONCLUSION

For the foregoing reasons, Appellants maintain that claims 1-3, 5, 6, 30-35 and 37-43 meet the requirements for patentability under 35 U.S.C. § 103, and reversal of the Examiner's rejections is therefore appropriate and respectfully solicited.

Respectfully submitted,

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May 26, 2009

EXHIBIT 1

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL P. GALLIGAN,
ALBERT K. BOND AND
JOSEPH C. DETTLING

Appeal 2007-1178
Application 10/376,836
Technology Center 1700

Decided: May 21, 2007

Before EDWARD C. KIMLIN, CATHERINE Q. TIMM, and LINDA M.
GAUDETTE, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-7, 46, and 47.

Claims 1 and 46 are illustrative:

1. A catalyst member comprising:

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a carrier substrate having a metal anchor layer disposed thereon by electric arc spraying, wherein the anchor layer comprises nickel and aluminum; and

catalytic material disposed on the anchor layer.

46. A catalyst member comprising:

an open carrier substrate selected from the group consisting of at least one of monolithic honeycomb carrier substrate, woven mesh, non-mesh, wadded fibers, and foamed metal, the open substrate having a plurality of fluid flow paths thereon and being characterized by having a portion of the surface area thereof obscured relative to a line of sight from a spray head, the substrate having a metal anchor layer disposed thereon by electric arc spraying the open substrate from the spray head; and

catalytic material disposed on the metal anchor within the gas flow passages.

The Examiner relies upon the following references in the rejection of the appealed claims:

Rondeau	US 4,027,367	Jun. 7, 1977
Ishida	US 4,455,281	Jun. 19, 1984
Donomoto	US 4,798,770	Jan. 17, 1989
Gorynin	US 5,204,302	Apr. 20, 1993
Draghi	US 6,042,879	Mar. 28, 2000

Appellants' claimed invention is directed to a catalyst member comprising a metal anchor layer formed on a carrier substrate by electric arc spraying and a catalytic material disposed on the anchor layer. Claim 1 on appeal recites that the anchor layer comprises nickel and aluminum, whereas claim 46 on appeal defines "an open carrier substrate" selected from the recited group of substrates, e.g., woven and non-woven mesh. Claim 46 also recites that the open substrate has "a plurality of fluid flow paths thereon and

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being characterized by having a portion of the surface area thereon obscured relative to a line of sight from a spray head."

Appealed claims 3, 6, 7, and 46 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ishida. The appealed claims also stand rejected under 35 U.S.C. § 103(a) as follows:

(a) claims 1-7, 46, and 47 over Ishida in view of Donomoto or Draghi,

(b) claims 1, 2, 4, 6, and 7 over Gorynin in view of Rondeau.

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we fully concur with the Examiner that the claimed subject matter is unpatentable over the cited prior art. Accordingly, we will sustain the Examiner's rejections for the reasons set forth in the Answer, which we incorporate herein, and we add the following primarily for emphasis.

We consider first the Examiner's rejection of claims 3, 6, 7, and 46 under § 102 over Ishida. Ishida, like Appellants, discloses a catalyst member comprising a metal anchor layer coated on the substrate by electric arc spraying and a catalytic material disposed on the metal anchor layer. It is Appellants' contention that the substrate of Ishida is not an "open carrier substrate," and also that the catalyst member of Ishida does not have the presently claimed "plurality of fluid flow paths thereon and being characterized by having a portion of the surface area thereof obscured relative to a line of sight from a spray head."

For the claimed "open carrier substrate," Appellants refer to their Specification at page 10, lines 21-27. Appellants assert that the

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Specification "distinguishes between the perforated metal plates of the type disclosed in Ishida et al. and the open carrier substrate recited in claims 3, 6, 7, and 47" (page 6 of Brief, second para.). The cited Specification reads as follows:

An open substrate defines numerous apertures, pores, channels or similar structural features that cause liquid and/or gas to flow therethrough in turbulent or substantially non-laminar fashion and give the substrate a high surface area per overall volume of the flow path of the fluid through the substrate, e.g., features that create a high mass transfer zone for the fluid therein. In contrast, a dense substrate, such as a plate, tube, foil and the like, has a relatively small surface area per overall volume of the flow path through the substrate regardless of whether it is perforated or not, and does not substantially disrupt laminar flow therethrough.

Notwithstanding Appellants' assertion to the contrary, we totally agree with the Examiner that Ishida describes an open carrier substrate which corresponds to the recitation in claim 46 and Appellants' Specification. According to claim 46, a monolithic honeycomb carrier substrate and a mesh qualify as an open carrier substrate, and Appellants' Specification states that substrates having structural features similar to apertures, pores and channels that cause turbulent flow qualify as open substrates. With this in mind, we find no error in the Examiner's factual determination that Ishida expressly describes carrier substrates that are in the form of Appellants' mesh and honeycomb. In particular, the carrier substrate depicted in Ishida's Figure 5 can be reasonably considered a mesh/honeycomb structure, particularly since Ishida specifically teaches that "[a]n

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expanded metal refers to a screen-shaped thin metal plate wherein a multiplicity of slits of short length are rendered in alternate and intermittent manner and tensile force is applied perpendicularly to those slits to form meshes," wherein the expanded metal plate of Figure 5 comprises metal portions 6A constituting meshes (col. 4, ll. 4-11). We also find no error in the Examiner's analysis that the perforated metal plate depicted in Figures 9-11 of Ishida can be reasonably characterized as a monolithic honeycomb substrate, and Appellants have not established otherwise (*see* page 5 of Answer, penultimate para.). Moreover, contrary to Appellants' argument, it is not clear on this record that a perforated, tubular metal substrate is not encompassed by the claimed "open carrier substrate," inasmuch as Appellants' Specification states that the perforated, tubular metal substrate of Figure 2H formed "a catalyst member in accordance with the present invention" (page 8 of Specification, ll. 12-13).

We also agree with the Examiner that the claim language "having a portion of the surface area thereof obscured relative to a line of sight from a spray head" is a limitation on the open substrate, not the fluid flow paths thereof, as asserted by Appellants. In essence, we agree with the reasoning set forth at page 11-12 of the Answer, namely, that the backside of Ishida's metal plate and projections are obscured relative to a line of sight from a spray head. Also, we note that it is implicit in Ishida's disclosure at column 6, lines 35 et seq., that catalyst layers disposed at opposite sides of the expanded metal substrate have portions thereof that are obscured relative to the

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pertinent line of sight. We also agree with the Examiner that even if, for the sake of argument, the obscured surface area is that of the flow path, "the 'surface area' of the flow paths would be the entire volume of the reactor, which would include the back side of the metal plate" (page 12 of Answer, first para.).

We now turn to the § 103 rejection of claims 1-7, 46, and 47 over Ishida in view of Donomoto or Draghi. Although Ishida, like Appellants, discloses a catalyst member having an anchor layer deposited on a carrier substrate by electric arc spraying, the reference does not expressly teach that the anchor layer comprises nickel and aluminum. However, we concur with the Examiner that Donomoto and Draghi, especially in light of the admitted prior art to Gorynin, evidences the obviousness of utilizing an anchor layer comprising aluminum and nickel for the catalyst member of Ishida. As explained by the Examiner, Donomoto and Draghi establish that it was known in the art that deposited alloys of aluminum and nickel are heat and corrosion resistant, properties desired by Ishida for the anchor layer. Also, Gorynin, as acknowledged by Appellants, specifically discloses an anchor layer for a catalyst on a substrate comprising the presently claimed aluminum and nickel, thereby alleviating any concerns about the compatibility of an anchor layer comprising aluminum and nickel and an overlying catalyst composition. While Appellants argue that Donomoto and Draghi do not teach that intermediate layers of nickel and aluminum have improved heat or corrosion resistance when used

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in *intermediate catalyst layers*, we agree with the Examiner that these properties of the alloy are not contingent upon their use.

We are also not persuaded by Appellants' argument that Donomoto, Draghi and Gorynin apply the aluminum/nickel alloy by plasma spraying rather than the claimed electric arc spraying. Appellants submit that one of ordinary skill in the art would not have combined the teachings of these references with Ishida because that "would destroy the desired feature of improving adhesion between the plasma-sprayed layer and a catalyst formed thereon" (page 11 of Brief, penultimate sentence). However, the modification proposed by the Examiner is that it would have been obvious to one of ordinary skill in the art to employ the electric arc spraying of Ishida for depositing an anchor layer comprising aluminum and nickel.

Finally, regarding the § 103 rejection of claims 1, 2, 4, 6, and 7 over Gorynin in view of Rondeau and Ishida, we will sustain the Examiner's rejection for the reasons set forth in our decision in Appellants' co-pending application, U.S. Serial No. 10/376,782, filed February 28, 2003 (Appeal No. 2007-1018). Suffice it to say that we agree with the Examiner that, based on the collective teachings of Gorynin, Rondeau, and Ishida, it would have been obvious for one of ordinary skill in the art to apply the aluminum/nickel-containing anchor layer of Gorynin by electric arc spraying as taught by Rondeau and Ishida. As set forth at pages 8-10 of the Answer, one of ordinary skill in the art would have understood that a certain balance must be effected in the determination of selecting either plasma spraying or

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electric arc spraying for depositing the anchor layer, including a typical cost/benefit analysis. Also, from a somewhat different perspective, as already discussed above and in our decision in the co-pending application, we agree with the Examiner that it would have been obvious for one of ordinary skill in the art, based on the teachings of Gorynin and Rondeau, to use an alloy comprising aluminum and nickel for the anchor layer in Ishida.

As a final point, we note that Appellants base no argument upon objective evidence of nonobviousness, such as unexpected results. Indeed, Appellants' Specification attributes no particular criticality to the selection of an alloy of aluminum and nickel for the anchor layer (*see* page 5, ll. 11-18).

In conclusion, based on the foregoing and the reasons well stated by the Examiner, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(iv)(effective Sept. 13, 2004).

AFFIRMED

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U.S. Pat. Appl. No. 10/612,658

Docket No.: 4576/4581A(CON)/ENG0012-00US

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EXHIBIT 2

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL P. GALLIGAN,
ALBERT K. BOND AND
JOSEPH C. DETTLING

Appeal 2007-1018
Application 10/376,782
Technology Center 1700

Decided: May 21, 2007

Before EDWARD C. KIMLIN, CATHERINE Q. TIMM, and LINDA M.
GAUDETTE, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 27-29 and 31-37.

Claim 27 is illustrative:

27. An exhaust treatment apparatus comprising:

a catalyzed open substrate having a substrate surface, and the
substrate selected from the group consisting of at least one of a honeycomb

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member, woven mesh, non-woven mesh, wadded fibers and foamed metal, the substrate defining a plurality of structural features selected from the group consisting of apertures, pores and channels and dimensioned and configured to permit the flows of fluid through the substrate, thereby defining fluid flow paths through the substrate, the catalyzed substrate having an electric arc sprayed metal anchor layer located on the substrate surface of the fluid flow paths and a catalytic material located on the anchor layer, the catalytic material comprising a bulk refractory metal oxide having dispersed thereon one or more catalytically active metal components and the anchor layer comprises nickel and aluminum; and

a canister having an inlet opening and an outlet opening and within which the catalyzed substrate is enclosed, the analyzed substrate being disposed between the inlet and outlet openings, whereby at least some of a fluid flowing through the canister between the inlet and outlet openings thereof is constrained to follow the fluid flow paths and thereby contact the catalytic material disposed on the anchor layer.

The Examiner relies upon the following references as evidence of obviousness:

Rondeau	US 4,027,367	Jun. 7, 1977
Ishida	US 4,455,281	Jun. 19, 1984
Fukui	US 5,569,455	Oct. 29, 1996

Appellants' claimed invention is directed to an exhaust treatment apparatus having a catalyzed substrate. An electric arc sprayed metal layer is coated on the substrate before the catalytic material is deposited thereon. The anchor layer comprises nickel and aluminum.

Appealed claims 27-29, 31, 32, 35, and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishida in view of Rondeau. Claims 33, 34, and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the stated combination of references further in view of Fukui.

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Appellants do not set forth separate arguments for claims 27-29, 31, 32, 35, and 36. Accordingly, these claims stand or fall with claim 27. Also, claims 33, 34, and 37 stand or fall together.

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the Examiner's rejections for essentially those reasons expressed in the Answer.

Appellants do not dispute the Examiner's factual determination that Ishida, like Appellants, discloses an apparatus for treating exhaust comprising a catalyzed open substrate comprising a metal honeycomb member (3), which substrate defines a plurality of channels that are dimensioned and configured to permit the flow of fluid through the substrate, wherein the catalyzed substrate is "made by electric arc spraying of molten metal anchor layer and a catalytic material on the anchor layer (see, for example, col. 5, lines 2-13)" (page 3 of Answer, penultimate para.). Also, the apparatus of Ishida comprises "a canister (2) having an inlet opening and an outlet opening and within which the catalyzed substrate (3) is enclosed; the catalyzed substrate (3) being disposed between the inlet and outlet openings ..." (page 3 of Answer, last para.). As appreciated by the Examiner, and urged by Appellants, Ishida does not teach that the anchor layer comprises nickel and aluminum, as presently claimed. Ishida teaches that the metal anchor layer may be the same type of material as the metal

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substrate, which includes thin steel plates, especially, thin stainless steel plates.

Rondeau, as acknowledged by Appellants, expressly teaches Appellants' electric arc spraying of a metal anchor layer comprising an alloy of nickel and aluminum onto a metal substrate. While Appellants contend that Rondeau provides no mention or suggestion "that such coatings would be desirable as a surface for the deposition of a catalytic material for an exhaust treatment apparatus to improve the adherence of the catalytic material thereon" (page 10 of Brief, second para.), we concur with the Examiner that it would have been obvious for one of ordinary skill in the art to employ the specific, metal anchor layer of Rondeau in the apparatus of Ishida "to obtain a catalyst that is highly resistant to peel-off and has a good adhering property to the surfaces of the metal place [sic, plate]" (page 4 of Answer, third para.).

Also, we find that the admitted prior art found in Appellants' Specification buttresses the Examiner's conclusion of obviousness. In particular, Appellants acknowledge that the US patent to Gorynin et al., US 5,204,302, expressly teaches the flame or plasma spraying of a metal adhesive, or anchor layer, comprising nickel and aluminum to enhance the adhesion to the substrate of a subsequently applied catalyst composition. Hence, the admitted prior art evidences that one of ordinary skill in the art would have had the requisite reasonable expectation of success with respect to the compatibility of a metal anchor layer comprising nickel and aluminum in the exhaust treatment apparatus of Ishida. We note that Appellants have advanced no reason why one of

ordinary skill in the art would have been dissuaded from using an anchor layer comprising nickel and aluminum, which was admittedly known in the art for bonding catalyst compositions to a metal substrate, in the apparatus of Ishida.

We are not persuaded by Appellants' argument that "the disclosure of Ishida teaches away from applicants [sic, applicants'] claimed invention because the stainless steels specifically recited in Ishida do not contain nickel and aluminum" (page 8 of Brief, first full para.). In our view, Ishida's preference for a match between the metal of the substrate plate and the anchor layer is not a teaching away from the claimed anchor layer. The reference disclosure of steel for the substrate is only exemplary, not exclusive, and presumably indicates a preference for optimum adhesion between layers of the same material. We find that one of ordinary skill in the art would have found it obvious to utilize a variety of compositions for the metal anchor layer in Ishida, including the admittedly known composition comprising aluminum and nickel. We note that Appellants have not set forth an argument, let alone objective evidence, with respect to unexpected results attached to the use of an anchor layer comprising aluminum and nickel. Indeed, Appellants' Specification indicates that other compositions for the anchor layer may be used as well, including the steels employed by Ishida.

Regarding the § 103 rejection of claims 33, 34, and 37 over the additional disclosure of Fukui, we completely agree with the Examiner that Fukui establishes the obviousness of using a ceramic or metal material for the catalytic substrate. As noted by the Examiner, Appellants have

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presented no objective evidence of unexpected results pertaining to the use of a ceramic substrate instead of the metal substrate of Ishida. While Appellants point out that Fukui "utilizes chemical vapor deposition to form a catalyst bonding layer on the surface of a base material" (page 12 of Brief, last para.), and not the molten metal spraying of Ishida and Rondeau, Appellants have not explained why this difference in the choice of deposition techniques would have rendered nonobvious the use of a ceramic material, a known catalyst substrate, for the substrate of Ishida's apparatus. Contrary to the argument made by Appellants, the Examiner's rejection does not call for an *addition* of a ceramic base material to the metal substrate of Ishida but, simply, the substitution of one known catalyst substrate for another. (*See* para. bridging pages 12 and 13 of Brief).

In conclusion, based on the foregoing and the reasons set forth by the Examiner, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(iv)(effective Sept. 13, 2004).

AFFIRMED

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